

REVIEW OF THE EASTERN NORTH AMERICAN *DICYPHUS*, WITH A KEY TO SPECIES AND REDESCRIPTION AND NEOTYPE DESIGNATION FOR *D. VESTITUS* UHLER (HETEROPTERA: MIRIDAE)

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Abstract.—*Dicyphus vestitus* Uhler is redescribed and a neotype from Colorado is designated for it. A dorsal adult habitus and selected scanning electron micrographs of *D. vestitus* and an identification key are provided to help recognize the eastern North American species of the genus. Distributions and host records are given for other eastern North American species.

Key Words: Insecta, Heteroptera, Miridae, plant bugs, eastern North America, *Dicyphus*, redescription, neotype, distribution, hosts, key

In a continuing effort to clarify and describe the mirid fauna of eastern North America, I redescribe the poorly known species *Dicyphus vestitus* Uhler and designate a neotype to ensure stability. Henry and Wheeler (1988) listed 25 species of *Dicyphus* Fieber for Canada and the United States, eight of which are recorded from east of the 95th Meridian. Cassis (1986), in a comprehensive treatment of the Dicyphinae, showed that more than half the species previously placed in *Dicyphus* belonged in other genera, an interpretation followed by Schuh (1995) in his catalog of the Miridae of the world.

The subfamily placement of *Dicyphus* and related genera is unsettled. Cassis (1986) placed these taxa in Dicyphinae, whereas Henry and Wheeler (1988) grouped them as the tribe Dicyphini, within Bryocorinae. Schuh (1995) followed his earlier treatment (Schuh 1976) by reducing the group to the subtribe Dicyphina, within a redefined Dicyphini (which also included

the subtribes Monaloniina and Odoniellina), all within Bryocorinae, a problematic subfamily that almost certainly is not monophyletic.

The genus *Dicyphus* in eastern North America is comprised of *D. vestitus*, along with *D. discrepans* Knight, *D. famelicus* (Uhler), *D. gracilentus* Parshley, and *D. hesperus* Knight. The remaining three eastern U.S. species of *Dicyphus* listed by Henry and Wheeler (1988) belong in *Tupiocoris* China and Carvalho [*T. rhododendri* (Dolling), *T. rubi* (Knight), and *T. similis* (Kelton)] (Schuh 1995).

In this paper, I redescribe *D. vestitus*, designate a neotype from Colorado, provide new distribution records, and give the first host association for this species. An adult dorsal habitus and SEM micrographs of *D. vestitus* and an identification key are provided to help recognize the eastern North American species of *Dicyphus*. Distributions and hosts are also summarized for the other eastern North American species.

Dicyphus discrepans Knight

Dicyphus discrepans Knight 1923: 477; Henry and Wheeler 1988: 262; Schuh 1995: 489.

Dicyphus discrepans was described from New York (Knight 1923) and later recorded from Alberta, British Columbia, Indiana, Michigan, Minnesota, New Brunswick, New Hampshire, North Dakota, Ontario, Oregon, Quebec, Saskatchewan, Washington, and Wisconsin (Henry and Wheeler 1988). *Aster* sp. [Asteraceae] is reported as the host (Knight 1923).

Dicyphus famelicus (Uhler)

Idolocoris famelicus Uhler 1878: 413.
Dicyphus famelicus: Atkinson 1890: 128; Henry and Wheeler, 1988: 262; Schuh 1995: 490.

Dicyphus famelicus was described from New Hampshire (Uhler 1878) and later reported from Illinois, Indiana, Maine, Massachusetts, Michigan, New Brunswick, New Jersey, New York, North Carolina, Nova Scotia, Ohio, Ontario, Pennsylvania, Quebec, West Virginia, and Wisconsin (Henry and Wheeler 1988). New state records are Maryland, Minnesota, and Virginia. The host is *Rubus odoratus* L. [Rosaceae] (Knight 1923) and *Rubus* sp.

Uhler's (1878) description was based on a male in the T. W. Harris Collection. I have studied the holotype deposited in the MCZ collection [Type number 26449, drawer 41], and find that it agrees in all respects with the currently accepted concept of *D. famelicus*. The type, glued to a paper triangle, is in good condition, except that segments III and IV on both antennae are missing. The exact label data are as follows: label 1, "101, N. H." [also present on this label is a faded "u," written in red ink]; 2, "97"; 3 (red label), "M.C.Z. Type 26449."

Other specimens examined.—MARYLAND: 8 ♂, 6 ♀, Garrett Co., Deep Creek Lake, 5 June 1982, T. J. Henry, taken on *Rubus* sp. (USNM). MINNESOTA: 2 ♂, 1

♀, Brainerd, Aug. 23–25, 1971, H. H. Knight (USNM). NORTH CAROLINA: 1 ♀, McDowell Co., nr. Little Switzerland, Rt. 226A, 10 Jul. 1988, T. J. Henry and A. G. Wheeler, Jr., on *Rubus* sp. nr. *odoratus* (USNM). VIRGINIA: 3 ♂, 4 ♀, Jefferson National Forest, June 6, 1967, R. C. Froeschner (USNM); 3 ♀, Bath Co., Rt. 678, 4 mi. N. Williamsville, 10 June 1984, T. J. Henry and A. G. Wheeler, Jr., on *Rubus* sp. (USNM); 2 ♂, 2 ♀, Highland Co., Rt. 250, Head Waters (shale barren), 9 June 1984, T. J. Henry and A. G. Wheeler, Jr., on *Rubus* sp. (USNM).

Dicyphus gracilentus Parshley

Dicyphus gracilentus Parshley 1923: 21; Henry and Wheeler 1988: 263; Schuh 1995: 491.

Dicyphus gracilentus was described from Illinois (Parshley 1923) and later recorded from Indiana and Ohio (Henry and Wheeler 1988). The host is leafcup, *Polymnia canadensis* L. [Asteraceae] (Parshley 1923).

Dicyphus hesperus Knight

Dicyphus hesperus Knight 1943: 56; Henry and Wheeler 1988: 263; Schuh 1995: 492.

Dicyphus hesperus is reported from Alberta, British Columbia, California, Colorado, Idaho (holotype), Illinois, Manitoba, Michigan, Minnesota, Montana, Nevada, New Brunswick, North Dakota, Ontario, Oregon, Quebec, Saskatchewan, Utah, and Washington (Kelton 1980, Henry and Wheeler 1988). Hosts recorded in the original description (Knight 1943) are mullein, *Verbascum* sp., *Verbascum virgatum* Stokes [Scrophulariaceae], *Stachys albens* Gray [Lamiaceae], and tomato [Solanaceae]. Field mint, *Mentha arvensis* L. [Lamiaceae], also has been given as a host (Kelton 1980).

Dicyphus vestitus Uhler

(Figs. 1–5)

Dicyphus vestitus Uhler 1895: 46; Henry and Wheeler 1988: 264; Schuh 1995: 495.

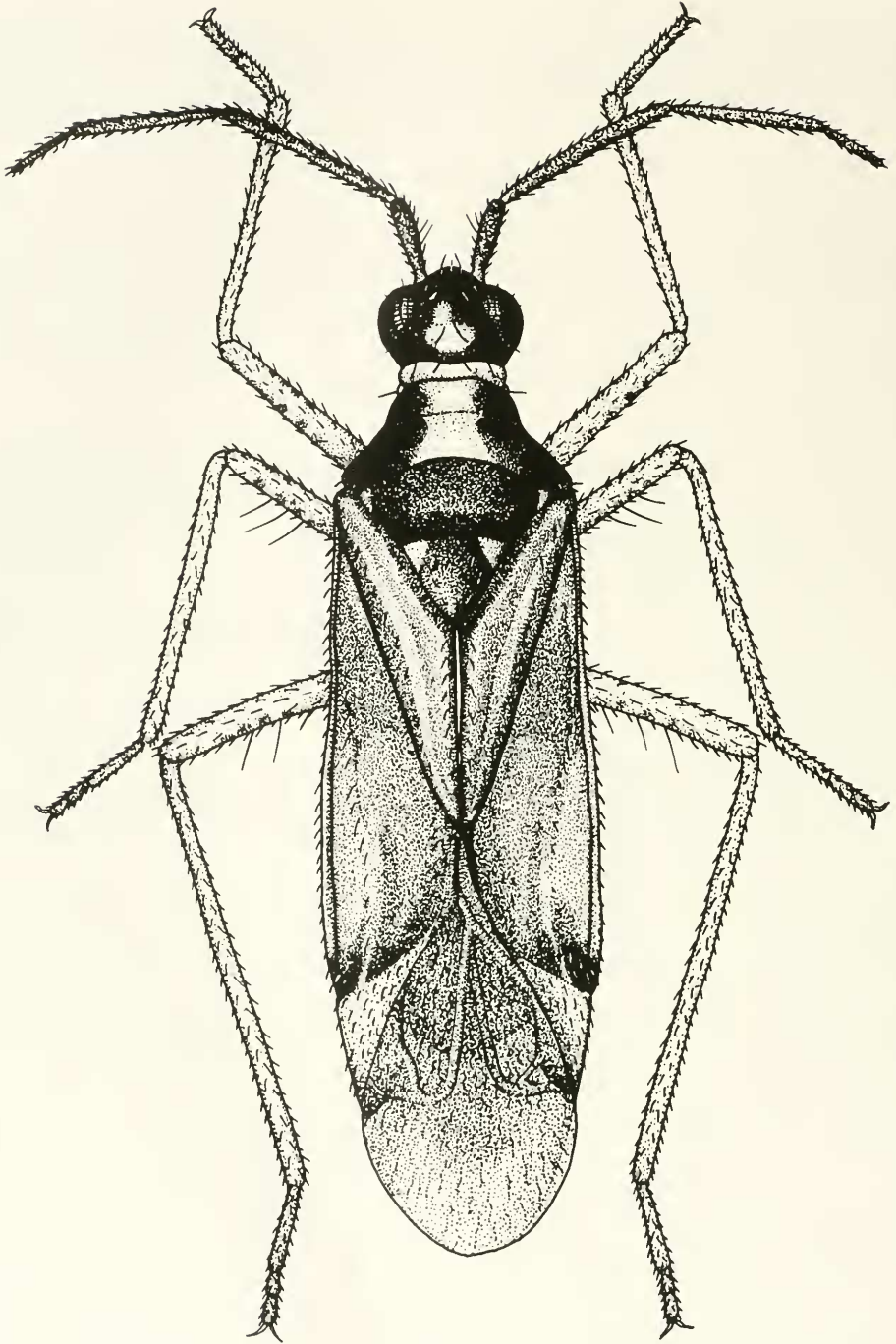
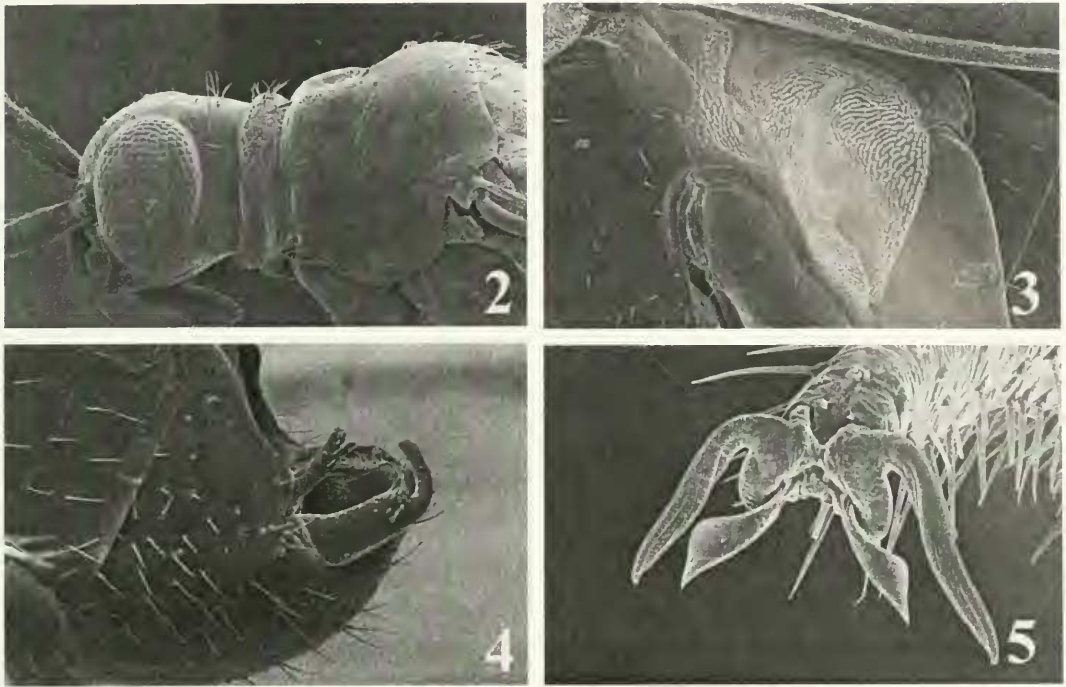


Fig. 1. Dorsal adult habitus of *Dicphyus vestitus* (σ).



Figs. 2–5. *Dicyphus vestitus*. 2, Head and pronotum, lateral aspect (110 \times). 3, Ostiolar area (256 \times). 4, Male genital capsule, lateral aspect (266 \times). 5, Claw (740 \times).

Dicyphus notatus Parshley 1922: 16. Synonymized by Knight 1927: 104.

Diagnosis.—*Dicyphus vestitus* is best recognized by the dark antennal segment II; pale legs; the coloration of the pronotum, ranging from broadly pale dorsally with only the lateral margins fuscous or black to predominately black with only the median area pale; and by the tubercle on the genital capsule just above the base of the left paramere.

Description.—*Male* (n = 10): Length 3.32–3.68 mm, width 1.00–1.06 mm. **Head** (Fig. 2): Width 0.54–0.56 mm, vertex 0.20–0.22 mm. **Rostrum**: Length 1.36–1.42 mm, extending beyond metacoxae to about 3rd abdominal segment. **Antenna**: Segment I, length 0.30–0.32 mm; II, 0.66–0.74 mm; III, 0.54–0.60 mm; IV, 0.34–0.36 mm. **Pronotum**: Length 0.40–0.42 mm, basal width 0.76–0.82 mm. **Genitalia**: Genital capsule rounded (Fig. 4), with a short slender tubercle on left side above paramere; left paramere elongate, slender, narrowed

and curved apically (Fig. 4); right paramere greatly reduced, wedgeshaped, tapered apically; vesica simple, membranous.

Female (n = 10): Length 3.44–3.64 mm, width 0.96–1.04 mm. **Head**: Width 0.56–0.58 mm, vertex 0.20–0.22 mm. **Rostrum**: Length 1.36–1.40 mm. **Antenna**: Segment I, length 0.30–0.32 mm; II, 0.74–0.78 mm; III, 0.56–0.58 mm; IV, 0.30–0.34 mm. **Pronotum**: Length 0.40–0.42 mm, basal width 0.82–0.84 mm.

General coloration shiny fuscous on head and pronotum, with paler gray to brown areas accented with dark brown on hemelytra. Head (Fig. 2) shiny fuscous, with a pale transverse oval spot just behind and between eyes. Rostrum pale brown, with segment IV becoming dark brown on apical half. Antenna usually uniformly fuscous, but with segment I sometimes slightly paler or reddish brown toward basal half. Pronotum trapeziform, strongly narrowed from base to anterior margin, basal margin deeply sinuate; coloration variable, ranging from

predominately pale dorsally with only the lateral margins shiny fuscous to largely fuscous or black with the area between the calli and midline of disc pale, collar pale or whitish, narrow transverse suture immediately behind collar tinged orange red; calli well delimited, separated from collar and disc by a distinct transverse suture anteriorly and posteriorly; mesoscutum broad, uniformly dull fuscous, anterior angles sometimes pale yellowish brown; scutellum dull fuscous, with anterior angles pale yellowish. Hemelytra generally pale smoky brown to gray, margins of clavus, including commissure, and apex of corium and cuneus darker brown; membrane and veins brown, slightly paler just beyond apex of cuneus. Ostiolar area (Fig. 3) grayish or brown, tinged with pale orange, particularly median area of auricle. Ventral surface shiny brown to fuscous; thoracic segments more fuscous, abdomen more dark yellowish brown. Legs uniformly pale yellowish brown, except for bases of coxae, distal (3rd) tarsomeres, and claws slightly darker brown; claws deeply dentate at bases (Fig. 5).

Remarks.—The coloration of this species is quite variable. The adult habitus furnished in this paper (Fig. 1) is based on the much darker specimens from Virginia that have the pronotum predominately fuscous to black, with only a narrow pale area between the calli and median line of the disc, as well as more darkly marked hemelytra, particularly the apex of the corium and cuneus. Most northern and western specimens of this species have much of the dorsum of the pronotum broadly pale, with only the pleural areas darkened, and the hemelytra have less distinct dark areas at the apex of the corium and cuneus. However, the general size, lengths of the antennal segments and their proportions to other body structures, shape of the left paramere, and presence of a tubercle above the left paramere convince me that these populations represent a single species.

Host.—The only previous plant associa-

tion was Froeschner's (1949: 162) report of this species hibernating under leaves of mullein, *Verbascum* sp. [Scrophulariaceae], in Missouri. Based on collections by A. G. Wheeler, Jr, this species is now known from heart-leaved skullcap, *Scutellaria ovata* J. Hill [Lamiaceae], a plant frequenting shale barrens and other dry shale outcrops, mostly on the eastern slopes of the Alleghenies (Strausbaugh and Core 1978, Wheeler 1995).

Distribution.—This species was described from Colorado (Uhler 1895) and later reported from California, Idaho, Illinois, Iowa, Minnesota, Missouri, New Hampshire, New Mexico, New York, Ohio, and South Dakota (Wheeler and Henry 1988). Records from California, New Mexico and, perhaps, other western records need confirmation. Virginia represents a new state record and a considerable range extension in the eastern United States.

Type designation.—Uhler (1895) stated in his original description that the types of this species were from Fort Collins, Colorado, collected from May 20th to June 4th and from Montrose on June 24th. Only one male Baker specimen from Fort Collins fitting the original description was discovered in the USNM collection, but it was taken on June 7th and, therefore, could not have been part of the original series. This specimen fits the original description and the accepted concept followed by Knight (1927, 1929), including the presence of a distinct tubercle above the left paramere, and is here designated as the neotype: Label 1, "Colo 1547" [Fort Collins, 6-7-95]; 2, "Collection CF Baker"; 3, "Dicyphus vestitus Uhler, det RI Sailer"; 4, "Neotype: ♂, Dicyphus vestitus Uhler, by T. J. Henry." Deposited in USNM collection.

Other specimens examined.—COLORADO: 1 ♀, Ft. Collins, Col., 5/24, 99, H. H. Knight collection, 1976 (USNM); 1 ♀, Ft. Collins, Dixon's Canyon, Aug. 19, 1898, E. D. Ball (USNM). ILLINOIS: 1 ♂, Urbana, III-18-1888; (USNM); 1 ♂, Cary, May 14, 1936, Ross & Mohr (USNM).

IOWA: 17 ♂, 16 ♀, Ames, May 7, 1927, H. H. Knight (USNM). MINNESOTA: 1 ♀, Norman Co., ix-30-1932, A. A. Nichol (USNM). MISSOURI: 1 ♂, Midway, III-25-1939, R. C. Froeschner (USNM). NORTH DAKOTA: 1 ♂, 1 ♀, Fargo, Oct. 16 1921, O. A. Stevens (USNM). VIRGINIA: 30 ♂, 35 ♀, Alleghany Co., Rte. 42 NE of Clifton Forge, 1 August 1993, A. G. Wheeler, Jr., on *Scutellaria ovata* (USNM); 3 ♂, 11 ♀, Bath Co., Millboro Barrens, 17 July 1993, A. G. Wheeler, Jr., on *Scutellaria ovata* (USNM; 3 ♂, 7 ♀, and nymphs (all in alcohol), Rockbridge Co., James River Face Wilderness, 0.9 mi. ENE of Sulphur Spring, el. 2,260', 1 Sept. 1993, T. J. Rawinski, collected on *Scutellaria ovata* (USNM).

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KEY TO THE EASTERN NORTH AMERICAN SPECIES OF *DICYPHUS*

- 1. Pronotum black, at least along lateral margins or pleural areas; antennal segment II dark brown or fuscous 2
- Pronotum pale; antennal segment II pale, sometimes with apex or base fuscous 3
- 2. Antennal segment II distinctly longer than basal width of the pronotum; male genital capsule without a tubercle above left paramere *D. gracilentus* Parshley
- Antennal segment II distinctly shorter than basal width of the pronotum; male genital capsule with a distinct tubercle above left paramere *D. vestitus* Uhler
- 3. Length of antennal segment I nearly equal to width of head across eyes; antennal segment II reddish brown to fuscous at base and apical ¼; hemelytra always macropterous *D. famelicus* (Uhler)
- Length of antennal segment I shorter, subequal to width of vertex, plus diameter of one eye; antennal segment II pale basally, narrowly reddish brown or fuscous only on apical ½ or less; hemelytra brachypterous or macropterous 4
- 4. Antennal segment I fuscous to black; antennal segment II subequal to basal width of pronotum *D. hesperus* Knight
- Antennal segment I mostly pale; antennal segment II distinctly longer than basal width of pronotum *D. discrepans* Knight

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